

On the Surgical Management of Diffuse Low-Grade Gliomas in Adults

Akademisk avhandling

Som för avläggande av Medicine doktorexamen vid Sahlgrenska akademien, Göteborgs universitet kommer att offentligens försvaras i Hörsal Arvid Carlsson, Academicum, Medicinaregatan 3, den 1 december 2023 klockan 09.00

av Louise Carstam

Fakultetsopponent:

Walter Stummer, Professor

Universität Münster, Tyskland

Avhandlingen baseras på följande delarbeten

- I. Carstam L, Rydén I, Gulati S, Rydenhag B, Henriksson R, Salvesen Ø, Smits A, Jakola AS.J. *Socioeconomic factors affect treatment delivery for patients with low grade glioma: a Swedish population-based study*. J Neurooncol. 2020 Jan
- II. Carstam L, Corell A, Smits A, Dénes A, Barchéus H, Modin K, Sjögren H, Ferreyra Vega S, Bontell TO, Carén H, Jakola AS. *WHO Grade Loses Its Prognostic Value in Molecularly Defined Diffuse Lower-Grade Gliomas*. Front Oncol. 2022 Jan
- III. Carstam L, Rydén I, Jakola AS *Seizures in patients with IDH-mutated lower grade gliomas*. J Neurooncol. 2022 Nov
- IV. Carstam L, Latini F, Solheim O, Bartek J Jr, Pedersen LK, Zetterling M, Beniaminov S, Sjøvik K, Ryttefjors M, Jensdottir M, Rydenhag B, Smits A, Jakola AS. *Long-term follow up of patients with WHO grade 2 oligodendroglioma*. J Neurooncol. 2023 Aug

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Louise Carstam

Neurokirurgiska kliniken, Institutionen för Neurovetenskap och Fysiologi,
Sahlgrenska akademien, Göteborgs universitet, Sverige, 2023

ABSTRACT

Diffuse low-grade gliomas (dLGG) are rare, slow-growing, yet difficult-to-treat brain tumors that typically affect young to middle-aged adults.

The aim of the thesis has been to identify factors affecting management and outcome in terms of symptoms and primarily survival for patients with dLGG. Methods used have been uni- and multivariable analyses in institutional, national, and international dLGG cohorts.

In study I, the potential effect of socio-economic factors of the patient on the surgical management was evaluated, showing that poor socio-economy was associated with longer waiting times to surgery.

Study II assessed prognostic factors in molecularly defined dLGG patients with respect to the two major subtypes of these tumors, astrocytomas and oligodendrogliomas, demonstrating different results for the different tumor types. These findings underscore the importance of not treating these tumor types as a single entity.

In study III epileptic seizures in dLGG before and after surgery was assessed in molecularly defined cohorts, showing what factors affect seizure outcome.

In study IV, a multi-institutional long-term study of molecularly defined oligodendrogliomas, the median overall survival time (17.8 years) was longer than in earlier non-molecularly classified cohorts. In this study, small tumor size, young age and good patient pre-operative functional level were independent predictors for prolonged survival.

Conclusion and implications: Adequate prognostication is important in the often long surviving dLGG patients and may guide treatment decisions, but prognostic factors must be obtained through subtype specific analyses.

Keywords: Diffuse Low-Grade Gliomas, Surgery, *IDH*-mutation